IN THE CLAIMS:

Please cancel claims 1-10, and amend the claims as follows:

Claims 1 - 10 (Canceled)

1. (New) A system for measuring orthogonally polarized Bragg wavelengths, comprising:

a polarized light source;

at least one birefringent fiber Bragg grating (FBG) sensor for reflecting the orthogonally polarized Bragg wavelengths;

a polarization controller; and

an FBG wavelength interrogation apparatus that measures the Bragg wavelengths of the at least one birefringent FBG sensor for determining a minimum and a maximum Bragg wavelength of each FBG sensor.

2. (New) The system of claim 1, wherein the polarization controller scans a range of polarization states in a time period, the range includes two orthogonal polarization states corresponding to the minimum and maximum Bragg wavelengths.

3. (New) The system of claim 1, further comprising a signal processing unit that provides feedback to the polarization controller to change the polarization state in order to track the minimum and maximum Bragg wavelengths of each birefringent FBG sensor.

4. (New) The system of claim 1, wherein the polarized light source comprises a polarized laser.

5. (New) The system of claim 1, wherein in the polarized light source comprises:

a non-polarized source; and

a polarizer.

6. (New) The system of claim 1, wherein in the polarized light source comprises a tunable, polarized, narrowband laser.

7. (New) The system of claim 1, wherein in the polarized light source comprises:

a broadband source;

a tunable narrowband optical filter; and

a polarizer.

8. (New) The system of claim 1, wherein the polarization controller comprises multiple liquid crystal cells capable of rotating an incoming polarization state to any other polarization state through a combination of electrical drive voltages to the liquid crystal cells.

9. (New) A system for eliminating fading of a signal and optimizing the signal's amplitude, comprising:

a light source;

at least one birefringent, dual-polarization fiber Bragg grating (FBG) sensor that reflects two orthogonally polarized eigenstates with different wavelengths;

a linear polarizer, wherein the two orthogonally polarized eigenstates pass therethrough;

a polarization controller used to align the two orthogonally polarized eigenstates at forty five degrees relative to the linear polarizer thereby providing a beat signal with a maximum amplitude; and

a detector for determining the beat signal frequency which is a measure of the signal.

10. (New) The system of claim 9, wherein the polarization controller scans a range of polarization states in a time period, the range includes the two orthogonally polarized eigenstates that correspond to a minimum and a maximum wavelength of each FBG sensor.

11. (New) The system of claim 9, further comprising a signal processing unit that provides feedback to the polarization controller to change the polarization state in order to track the two orthogonally polarized eigenstates that correspond to a minimum and a maximum wavelength of each FBG sensor.